Iranian Journal of Veterinary Science and Technology
Vol. 4, No. 1, 2012, 19-28

IJVST

Myiasis among slaughtered animals in Kashan, Iran: descriptive a veterinary entomological problem in the tropics

Rouhollah Dehghani[1], Mohammad Mehdi Sedaghat[2*], Nader Esmaeli[3], Ahmad Ghasemi[3]

[1] *Department of Environment Health, Kashan University of Medical Sciences, Kashan, Iran*
[2] *Department of Medical Entomology, School of Public Health, Teheran University of Medical Sciences,Tehran, Iran*
[3] *Department of Pathobiology, Kashan University of Medical Sciences, Kashan, Iran*

Received: September 26, 2011 Accepted: February 16, 2012

Abstract

Myiasis is a common veterinary entomology problem in many slaughterhouses in the tropics.Prevalence of myiasis among slaughtered cattle was investigated in Kashan abattoir, central Iran, in 2009. All kind of dipterous larvae that may cause myiasis were collected and identified then the prevalence of each infestation analyzed by statistical tests**.** The results of the study revealed a total of 4 species of dipterous larvae belonged to two families of Sarcophagidae and Oestridae. The identified species were as follows: Family Oestridae: *Hypoderma lineatum* (61.4%), *Hypoderma ovis* (12.6%), *Oestrus ovis* (22.7%) and Family Sarcophagidae: *Wohlfahrtia magnifica* (3.8%). Of the 7736 examined animals, 2.5% of goats and 0.5% of sheep were infested by any kinds of dipterous larvae. Statistical comparisons were made between sex of host species and occurrence of myiasis, infested animals and species of larvae, the infested body parts of host, and finally between the prevalence and origin of the cattle. Statistically the possibility of infestation of goats was 1.43 times more than sheep (odds ratio=1.43). These finding scan be considered by officials to keep the human and animal myiasis under control. There is also need to investigate the prevalence and incidence of animal myiasis in other parts of the country to clarify the spread of infestation in the country and in the region.

Keywords: Myiasis, *Oestrus ovis*, *Hypoderma lineatum*, *Hypoderma bovis*, *Wohlfahrtia magnifica*, Iran

* Corresponding author: Mohammad Mehdi Sedaghat
Email: sedaghmm@tums.ac.ir
Tel: +9821 889 51393
Fax: +9821 889 51393
P.O.: 14155-644

Introduction

Animal health is one of the major veterinary concerns which can affect human public health in communities. Endoparasitic or ectoparasitic infestations are known as the most important veterinary problems in tropical areas such as Iran. Myiasis is a parasitic infestation affecting livestock in many parts of the world. It can define as "the infestation of live vertebrate animals with dipterous larvae, which, at least for a certain period, feed on the host's dead or living tissue, liquid body substances, or ingested food" (Zumpt, 1965). Such feeding behaviors usually cause a major damage to the host tissues if left untreated (Zumpt, 1956). Myiasis often occurs in wild animals, but it also occurs in domestic animals and even humans (Hall, 1997, Wall, 1992 and Dehghani *et al* 2012).There are various types of myiasis that according to the species of fly, may involve obligate, facultative or in some cases accidental parasitic infestations. Myiasis can be classified according to the part of the body affected (Langan *et al*., 2004). Dermal and sub-dermal myiasis in animals due to invasion of Diptera larvae to skin tissues has economical importance to livestock industry. Nasopharyngeal myiasis in animal occur when the fly breed in nasal cavity of its host animal, in this case there are mild to serious symptoms in animal including loss of appetite, difficult breathing, snort and sneeze. However, all kind of myiasis damage animal welfare and cause significant economic losses to livestock through abortion, reduction of milk production, poor weight gain, infertility and low hide quality. Myiasis is a self-limiting infestation with minimal morbidity in the vast majority of cases (Bolognia *et al*., 2008), although if they leave untreated may lead to death (Zumpt, 1956) and to date there have been reported some fatal cases (Cestari et al., 2007). This kind of infestation has a worldwide distribution related to the latitude the various species of flies. The incidence of myiasis usually is higher in the tropics and subtropics than cold regions.

A number of articles have been published on myiasis in Iran. The earliest studies conducted by Minar in Iran, reported an ophthalmomyiasis in a woman in Tehran (Minar, 1976). Following him many cases of human myiasis have been reported in different parts of human body, by various fly species and in different parts of the country (Janbakhsh *et al*., 1977, Tirgarie *et al*., 1977, Jdalayer *et al*., 1978, Karimi and Vahidi 1999, Talari *et al*., 2002, Hakimi and Yazdi 2002, Razmjou *et al*., 2007,Soleimani *et al*., 2009 andSalimi *et al*., 2010). These reports indicated that the human myiasis is always linked to the animal myiasis or unhealthy environment. Several species of different families of order Diptera are involved in animal myiasis in Iran (Khoobdl *et al*., 2004). Unfortunately, research on veterinary entomology is not as much as medical entomology in Iran; there are a few investigations in veterinary entomology which have described the situation of myiasis among the cattle in some parts of the country. In a veterinary entomological research, Navidpour *et al*. reported the Old World Screw Worm, *Chrysomyia bezziana,* as one of the most common cattle myiasis in Iran. They also reported the first outbreak of cattle myiasis caused by *C. bezziana,* in south and south west of the country (Navidpour *et al*., 1996, 2009). In a study on the prevalence of cattle hypodermosis, Esmailnia *et al*. reported the cases of hypodermosis in Kazeroon abattoir in the Southern areas of Iran (Esmailnia *et al*., 2000). Recently Tavassoli et al. recorded the hypodermosis cases in the north areas of Iran (Tavassoli *et al*., 2010).

In order to protect *animal* and human health, this study was conducted to determine the prevalence of myiasis among slaughtered animals, discovering the larvae species and fauna of the flies responsible of myiasis in Kashan abattoir.

Materials and methods

Study area

The study was carried out among sheep and

goats slaughtered at Kashan Abattoir located in Kashan city, Isfahan province, central Iran. Kashan located in a warm and dry region and marginalized from the North and East to the desert with an altitude of 940 m, 33° 59′ N longitude 51°26′ E latitude. The average annual precipitation is 135 mm almost half the average rainfall in Iran and sixth precipitation of the world. It has a mean annual temperature of 14°C.

Study animals and the larvae collection

Heads and bodies of all slaughtered animals including sheep and goats at the abattoir were thoroughly examined for the presence of larvae of any flies. Cattle were brought there from other provinces including Kordestan, Fars, Isfahan, Qom and Lorestan. Both male and female animals were slaughtered in the abattoir. Cattle carcasses were examined one day per week in 24 times sampling at the abattoir from November 2008 to May 2009. The collections took a whole day each time at the slaughter house.

The five major sites in the heads, including nasal cavities, septum, middle meatus, conchae, and sinuses were examined for the presence of any kind of larvae. Skins and subcutaneous tissues of the whole body of cattle were thoroughly examined for the presence of dipterous larvae. The collected larvae were counted, washed in physiological saline solution (NaCl 0.9%) and preserved in a separate container for each carcass with 70% alcohol, then were transported to the Medical Entomology laboratory at Environment Health Department of Kashan University of Medical Sciences.

Laboratory examination

The collected larvae were processed for micro-slide preparation. The larvae were boiled in 10% potassium hydroxide (KOH) for an hour to clear the stigmal plates of posterior spiracles. The *samples* were then *washed* with *distilledwater*and glacial acetic acid for 15 and 10 minutes respectively. They were dehydrated in ascending grades of ethyl alcohol starting from 70% to absolute alcohol for 5–10 min in each grade. Then the specimens washed in xylol and cleared in cedar oil. The larvae were mounted using canada balsam. The identification key of Zumpt (1965) was used to identify.

Data analysis

Statistical comparisons were made using chi square test and Pearson correlation between sex of host species and occurrence of myiasis, the infested body parts of host, infested animals and species of larvae and finally between prevalence and origin of the cattle. All analyses were performed using SPSS for windows version 15, SPSS, Inc., Chicago, IL. All values of $p<0.05$ were considered significant.

Results

During this survey a total 7736 slaughtered cattle including 5934 sheep and 1802 goats were examined. Of the 7736 animals examined, 192 goats (2.5%) and 41sheep (0.5%) were infested by any kinds of dipterous larvae. Myiasis was seen in 3.2% of all goats and 2.3% of all sheep at the Kashan Abattoir (Table 1). There were significant differences in *myiasis* occurrence and the number of slaughtered animals by using *chi-square*analysis ($p < 0.037$).The dipterous larvae were found equally in male and female cattle (3.1%), and there was no significant association ($p < 0.999$) between percentages of myiasis and sex in both host species.The examined animals were categorized into four age groups; less than one years old, 1-2 years old, 2-3 years old and over 3 years old. The prevalence of myiasis in these age gropes were 1.3%, 52.8%, 35.2% and 10.7% respectively.

There was *significan tassociation* between host species and infestation, the possibility of infestation of goats was 1.43 times more than sheep (odds ratio=1.43).The infestation rates were different on cattle with myiasis.In 10.7% of cases, infestation caused by one larva, 13% by two larvae, 24% by three larvae and 52.3 % by four or more than four larvae.

The myiasis cases were observed in different body parts of the both host species, 74% of slaughtered sheep and goats had cutaneous myiasis, 22% nasopharyngeal myiasis, 2% urogenital myiasis and 2% traumatic myiasis. There was no *significant association* between the host body parts and occurrence of myiasis.

Four species of fly larvae were identified belonging to two families; Family Oestridae: *Hypoderma lineatum* (61.4%), *Hypoderma ovis* (12.6%), *Oestrus ovis* (22.7%), andFamily Sarcophagidae:*Wohlfahrtia magnifica* (3.8%). *Hypoderma lineatum* was the most common species larvae identified in the study (Table2). A total of 171 larvae belong to the genus *Hypoderma* were removed from the hides of infested cattle. Identification based on morphological characters showed that 83.6% were *H. lineatum* and 16.3% *H. bovis*. All *H. lineatum* larvae were found only on goats, while *H. bovis* were found equally on goats and sheep. A total 53 larvae identified as *Oestrus ovis*, which 66% of them were found on goats and 34% on sheep. During the study period, the larvae of *Wohlfahrtia magnifica* were found only on sheep.

Results of the current study showed no statistically significant associations in the prevalence of myiasis in sheep and goats from different origins. Accordingly, highest prevalence of myiasis was recorded in cattle from Qom followed by Isfahan, Fars, Kordestan provinces, whereas the lowest was observed in Lorestan Province (Table2).

Table 1. Frequency distribution of Myiasis based on cattle species.

Myiasis \ Cattle	Sheep n (Percent)	Goats n (Percent)
No	1761 (97.7)	5742 (96.8)
Yes	41 (2.3)	192 (3.2)
Total	1802 (100)	5934 (100)

Table 2. Frequency distribution of Myiasis based on origin provinces (Iran).

Myiasis \ Province	Kurdestan n (Percent)	Fars n (Percent)	Isfahan n (Percent)	Qom n (Percent)	Lorestan n (Percent)	Total n (Percent)
Hypoderma lineatum	17 (7.3)	36 (15.5)	27 (11.6)	58 (24.9)	5 (2.1)	143 (61.4)
Oestrus ovis	15 (6.4)	3 (1.3)	22 (9.4)	12 (5.1)	1 (0.4)	53 (22.7)
Hypoderma bovis	6 (2.5)	9 (3.8)	3 (1.3)	10 (4.3)	- -	28 (12)
Wohlfahrtia magnifica	- -	- -	9 (3.8)	- -	- -	9 (3.8)
Total	38 (16.3)	48 (20.7)	61 (26.1)	80 (34.4)	6 (2.5)	233 (100)

Discussion

The results of this study revealed presence of at least two families and a minimum of four species of flies inducing myiasis in Kashan Abattoir with allprevalence3%. *Hypoderma lineatum* and *H. bovis*, which cause hypodermosis in livestock, were on slaughtered animals in Kashan. Hypodermosis is an economically important infestation among cattle in the world (Soulsby, 1986), although it is under control in many European and North American Countries (Boulard,

2002). Before using chemotherapy and fly control, cattle hypodermosis rate was very high in some countries for instance almost 80% in Czech and Slovak Republics, 49.2% in Greece, 85% in Italy, 52.3% in Spain, 40% in United Kingdom, 32-43% in Romania and 1.9-68% in Turkey (O'Brien, 1997; Zeybek, 1988; El-Metenawy and Zayed, 1992). The infestation rate has been reported 35.5% and 23.5% in a slaughter house and in the field respectively in Pakistan (Ul-Hasan *et al*., 2008). In china the hypodermosis is highly distributed and in some areas the infestation rate is reported up to 100% (Yin *et al*., 2003).While the prevalenceofhypodermosis was 2.08% in the current study, it has reported earlier10.86% from Northwest ofthe country and 3% from Kazeroon in theSouth (Tavassoli *et al*., 2008, Esmailnia *et al*., 2000). *Hypoderma lineatum* was the most common hypodermosis agent in this study, the results agree with the findings from the study in the Southern parts of Iran. *Hypodermabovis* has been reportedas a dominate species in the Northwest of Iran; this finding was similar with the results obtainedfrom the studies in Turkey (Merdivenci, 1963,Mimioglu, 1966,Sayin and Meric, 1976,Karatepe and Karatepe, 2008). This similarity is the most probable attribute to the fact that the north-west of Iran and Turkey share the same climate. Likewise, as Kashan in the center of Iran has warm and dry climate like Kazeroon in the South, therefore the result of our study are in agreement with the result obtained from the study of Esmailnia *et al*. in 2000. Although, there are some evidence from experimental studies suggested that *H. lineatum*can not develop in goat hosts (Colwell and Otranto, 2006); we found all *H. lineatum* larvae only on slaughtered goats.The authors of the article have been found L3of *H. lineatum* on wild goats in Kashan area (unpublished data) which is an evidence of existing of a sylvatic cycle of the species in the area.

The sheep botfly, *Oestrus ovis* (Family: Oestridae), is widespread in many countries where sheep and goats are raised. Previous studies showed a various prevalence values of *O. ovis* larvae in sheep and goats in different countries for instance 24% in Jordan (Abo-Shehada *et al*., 2003), 67% in Algeria (Benakhla *et al*., 2004), 93.6% in Tunisia (Kilani *et al*.,1986), 21.9% in Zimbabwe (Pandey, 1989) and 22.6% in Libya (Gabaj *et al*., 1993). The prevalence of *O. ovis* in cattle in European countries has been reported from 21.9% to 97.18% (YilmaandDorchies, 1991, Caracappa *et al*., 2000,Dorchies *et al*., 2000, Reina *et al*., 2002, Bauer *et al*., 2002, Colebrook and Wall, 2004).In the present study, the prevalence of *O. ovis* was in the second place among the other infestations with prevalence 22.7%. However this parasitic infestation is common in sheep and goats in Iran. In a comparable study in Fars Abattoirs the prevalence of infestation reported 49.7% in sheep (JafariShoorijeh *et al*., 2009). Although, some authors mentioned that the infestation rate of *O. ovis* is always higher in sheep than in goats (Papadopoulos *et al*., 2006), on the contrary we found goats infestation nearly twice than sheep in this study. In Libya, the prevalence of *O. ovis* was recorded 22.6% in sheep and 18.4 % in goats (Gabaj *et al*., 1993), while it was 34% in sheep and 66% in goats in this study. However, the result of an investigation in Ethiopia agrees with our result (Yilma and Genet, 2000). In addition, *O. ovis* is the most common cause of human ophthalmomyiasis. Janbakhsh et al. reported a case of human ophthalmomyiasis in Tehran (Janbakhsh *et al*., 1977) and it is also recorded in a British soldier in Afghanistan (Stacey and Blanch, 1998).

The fleshfly, *Wohlfahrtia magnifica* (family Sarcophagidae) has been considered as an important obligatory parasite in the wounds of human and animals. Wohlfahrtiosis is found from Europe (mainly in Southern and Eastern Europe) and Mediterranean basin to North Africa and Asia (Zumpt, 1965, Hall and Farkas, 2000 and Hall *et al*., 2009). In this study, overall 3.8% of all myiasis was caused by *W. magnifica* and found only in sheep. The

similar result has been recorded from an investigation in an Italian farm with 3% infested sheep and no parasitized goats (Giangaspero *et al*., 2010). In Israel *W. magnifica* is known as parasite of domestic animals including dog, goat, sheep, camel, horse and cat (Schnur *et al*., 2009). It was also recorded in an outbreak in Greece with a great economical impact on the livestock sectors (Sotiraki *et al*., 2002). *Wohlfahrtia magnifica* was recorded as the only species in wounds of sheepin a study in Hungry (Farkas *et al*., 1997), as it had been reported earlier in sheep from Azerbaijan in northwest Iran by Iranian investigators (Janbakhsh *et al*., 1975). Human myiasis caused by *W. magnifica* has been reported from many countries. Mohammadzadeh *et al*. reported a case of human *gingival myiasis* from a four year old mental retarded boy from Bushehr Province in Iran (Mohammadzadeh *et al*., 2008). There are also reports describing human cases of urogenital myiasis due to *W. magnifica* in both male and female (Delir *et al*., 1999 and Edalat, 2010). It is also recorded human Ophthalmomyiasis due to *W. magnifica* in Iran (Chams *et al*., 1992). Furthermore, in a thorough investigation, Ghasemi reported human wound myiasis during the wartime between Iran and Iraq (Ghasemi,1988).All these reports showed that the species take action as an important myiasis agent in the country.

Results of the current study revealed that the most infested animals came from Qom Province (34.4%), whereas the least were from Lorestan Province (Table2). Accordingly, the prevalence of infestations was 26.1%, 20.7%, and 16.3% from Isfahan, Fars and Kordestan provinces respectively. All animals with wohlfahrtiosis, as it was only in sheep, came from Isfahan, while we had no cases of wohlfahrtiosis from the other mentioned providences. The majority cases of hypodermosis were recorded among the slaughtered sheep and goats which came from Qom Province with prevalence 24.9% and 5.1% due to *H. lineatum* and *H. ovis* respectively. However, *H. lineatum* observed only in goats from all mentioned providences. In contrast, we observed *H. ovis* with the exactly same prevalence in both host species. The most prevalence of O. ovis was observed in both sheep and goats from Isfahan Province (9.4%), while the least infestation with just one case recorded from Lorestan (0.4%). Despite of differences in prevalence of myiasis in slaughtered animals from different origins, there was no statistically significant variation between the prevalence of myiasis and origins of livestock.

This study revealed the intermediate prevalence of some myiasis agents among the imported livestock to Kashan. There are some fly families which cause myiasis in livestock and occasionally in humans. Although the adult flies are not parasitic, but fly control can reduce the agents of myiasis. *Environmental sanitation* is always an important measure in fly control and is considered as the key factor to prevent of this infestation in communities. The majorities of previous studies emphasized that there are some associations between the animal and the human myiasis that posed the important of treatment of animal or human infestations as a significant prevention method of myiasiscontrol in communities. However, it cannot be denied the role of veterinary inspections and necessity of promoting animal health.Inconclusion, there is a need for more comprehensive veterinary and entomological studies in order to identify endemic and non-endemic areas in the country and the region. The results of this study would be valuable for the officials to keep the human and animal myiasis under control.

Acknowledgements

The authors gratefully acknowledge the Scientific Research Projects Unit of Kashan University of Medical Sciences for its financial support.The authors also are grateful to Dr Roya Sadeghi, School of Public Health, Teheran University of Medical Sciences, Iran, for critically reviewing the manuscript.

Conflict of interest

There is no conflict of interest in this paper.

References

Abo-shehada, M.N., Batainah, Th., Abuharfeil, N., Torgerson, P.R. (2003) *Oestrus ovis* larval myiasis among goats in northern Jordan. *Preventive Veterinary Medicine* **59**,13-19.

Bauer, C., Steng, G., Prevot, F., Dorchies, P. (2002) Seroprevalence of *Oestrus ovis* infestation in sheep in southwestern Germany. *Veterinary Parasitology* **110**, 137–143.

Benakhla, A., Sedraou, S., Benouareth, D.E., Cabaret, J., Boulard, C. (2004) Epidemiology of sheep infection by *Oestrus ovis* in Algeria.*Parasite* **11**, 235–238.

Bolognia, J.L**.**, Jorizzo, J.L**.**, Rapini, R. **(2008)** Cutaneousmyiasis. In:Dermatology**.** Vol 1**.**2 nded**.** Mosby Elsevier 2008,1300-01.

Boular, C. (2002) Durably controlling bovine hypodermosis. *Veterinary Research* **33**, 455–464.

Caracappa, S., Rilli, S., Zanghi, P., Di Marco, V., Dorchies, P. (2000) Epidemiology of ovine oestrosis (*Estrus ovis* Linné 1761, Diptera: Oestridae) in Sicily. *Veterinary Parasitology* **92**, 233 – 237.

Cestari, T.F., Pessato, S., Ramos-e-Silva, M. (2007) Tungiasis and myiasis. *Clinics in Dermatology* **25**,158-64.

Chams, H., Kheirieh, A., Tirgari, S., Zaim, M., Javadian, E. (1992) Ophthalmomyiasis in an advanced retinoblastoma. *Orbit* **11**, 31–33.

Colebrook, E., Wall, R.M. (2004) Ectoparasites of livestock in Europe and the Mediterranean region. *Veterinary Parasitology* **120**, 251-274.

Colwell, D.D., Otranto, D. (2006) Cross-transmission studies with Hypoderma lineatum de Vill. (Diptera: Oestridae): Attempted infestation of goats (Capra hircus).*Veterinary Parasitology* **141**, 302–306.

Dehghani, R., Sedaghat, M.M., SabahiBidgoli, M. (2012) Wound Myiasis Due to Muscadomestica (Diptera: Muscidae) in Persian Horned Viper, Pseudocerastespersicus (Squamata: Viperidae). *Iranian Journal of Arthropod-Borne Diseases* **6**, 88-89.

Delir, S., Handjani, F., Emad, M., Ardehali, S. (1999) Vulvar myiasis due to *Wohlfahrtia magnifica. Clinical and Experimental Dermatology* **24**, 279–280.

Dorchies, P.H., Bergeaud, J.P., Tabouret, G., Duranton, C., Prevot, F., Jacquiet, P.H. (2000) Prevalence and larval burden of *Oestrus ovis* (Linné 1761) in sheep and goats in the northern Mediterraneanregion of France. *Veterinary Parasitology* **88**, 269 – 273.

Edalat, H. (2010) Human Urogenital Myiasis Caused by *Luciliasericata*(Diptera, Calliphoridae) and *Wohlfahrtia magnifica* (Diptera,Sarcophagidae) in Markazi Province of Iran. *Iranian Journal of Arthropod-Borne Diseases* **4**, 77-80.

El-Metenawy, T.M., Zayed, A.A. (1992) The prevalence of Hypoderma lineatum and Hypoderma bovis (Diptera : Oestridae) infesting cattle in Istanbul region, Turkey, *Veterinary Medical Journal Giza* **40**, 145–151.

Esmailnia, K., Monfared, A.N., Derakhshanfar, A. (2000) Study on the prevalence of cattle hypodermosis in Kazeroon abattoir. *Pajouhesh Va Sazandegi* **4**, 92–93.

Farkas, R., Hall, M.J., Kelemen, F. (1997) Wound myiasis of sheep in Hungary. *Veterinary Parasitology* **69**, 133-44.

Gabaj, M.M., Beesley, W.N., Awan, M.A.Q. (1993) *O estrus ovis* myiasis in Libyan sheep and goats. *Tropical Animal Health and Production* **25**, 65 – 68.

Ghasemi, M.J. (1988) Distribution of human myiasis in Iran. [MSc dissertation]. School of Public Health, Tehran University of Medical Sciences, Iran. [in Persian].

Giangaspero, A., Traversa, D., Trentini, R., Scala, A., Otranto, D. **(**2011):Traumatic myiasis by Wohlfahrtia magnifica in Italy. *Veterinary Parasitology* **175**, 109-112.

Hakimi, R., Yazdi, I. (2002) Oral mucosa myiasis caused by *Oestrus ovis*. *Archives of Iranian Medicine* **5**, 194–196.

Hall, M.J. (1997) Traumatic myiasis of sheep in Europe: a review. *Parasitologia* **39**, 409–413.

Hall, M.J., Farkas, R. (2000) Traumatic myiasis of humans and animals. In: Papp, L., Darvas, B. (Eds.), Contributions to a Manual of PalaearcticDiptera. Science Herald, Budapest 751–768 (Chapter 1.18).

Hall, M.J., Testa, J.M., Smith, L., Adams, Z.J.O., Khallaayoune, K., Sotiraki, S., Stefanakis, A., Farkas, R., Ready, P.D. (2009) Molecular genetic analysis of populations of Wohlfahrt's wound myiasis fly, *Wohlfahrtia magnifica*, in outbreak populations from Greece and Morocco. *Medical and Veterinary Entomology* **23** (Supplement1), 72-79.

JafariShoorijeh, S., Negahban, S., Tamadon, A., Behzadi, M.A. (2009) Prevalence and intensity of *Oestrus ovis* in sheep of Shiraz, southern Iran. *Tropical Animal Health and Production* **41**, 1259-1262.

Janbakhsh, B., Pirouz, M.S., Tirgari, S., Aghamohammadi, A. (1977) A case of ophthalmomyiasis in man by Oestrus ovis Linneaeus in Tehran (Insecta: Diptera, Oestridae). *Acta MedicaIranica* **20**, 19-26.

Janbakhsh, B., Tirgari, S., Aghamohamadi, A. (1975) Myiasis in Iranian sheep. *Iranian Entomological Society Letter* **3**, 8-12.

Jdalayer, T., Maleki, M., Moghtader, M. (1978) Human urogenital myiasis cause by *Chrysomyiabezziana*. *Iranian Journal of Public Health* **7**, 116–118.

Karatepe, M., Karatepe, B. (2008) Hypodermosis in cattle slaughtered in Nigde province, Turkey. *Tropical Animal Health and Production* **40**, 383–386.

Khoobdel, M., SeyediRashti, S.M.A., Shayeghi, M., Tirgari, S. (2004) The survey fauna of Calliphoridae and Sarcophagidae flies in Tehran and suburb Public Health research. *Journal of School of Public Health and Institute of Public Health Researches* **2**, 69-78.

Kilani, M., HadjKacem, H., Dorchies, P.H., Franc ,M. (1986) Observations sur le cycle annual d '*Oestrus ovis* en Tunisie . *Revue MédicineVéterinaria* **137**, 451 – 457.

Karimi, Gh.,Vahidi, M.R. (1999) A case report of pharyngeal myiasis. *Journal of Shahid Sadoughi University of Medical Science and Health Services* **1**, 91–94.

Langan, S.M., Dervan, P., Loughlins, O. (2004) A moving scalp nodule in a returningtraveler. *British Journal of Dermatology* **151**, 1270.

Merdivenci, A. (1963) The occurence of Hypoderma lineatum in cattles in Turkey [in Turkish]. *Ankara Üniversitesi Veteriner Fakültesi Dergisi* **8**, 206-212.

Mimioglu, M. (1966) Hypodermosis on cattle and Ankara goats. *Ankara University Faculty of Veterinary and Agriculture Press* [in Turkish]. 43p.

Minar, J. (1976) A case of eye myiasis in man caused by first instar larvae of *Oestrusovis* L. (Diptera Oestridae) in Iran. *Folia Parasitologica* **23**, 283-284.

Mohammadzadeh, T., Hadadzadeh, R., Esfandiari, F., Sadjjadi, S.M. (2008) A Case of Gingival Myiasis Caused by Wohlfahrtia magnifica. *Iranian Journal of Arthropod-Borne Diseases* **2**, 53-56.

Navidpour, Sh., Hoghooghi-Rad, N., Goodrazi, H., Pooladgar, A.R. (1996) Outbreak of Chrysomya bezziana in Khoozestan Province, Iran. *Veterinary Record* **139**, 217.

Navidpour, Sh., Goudarzi, A., Gholamiyan, A., Jahanifard, E. (2009) Geographical Races of Old World Screw-Worm Fly, Chrysomyia bezziana Villeneuve,1914, in South-Western Iran. *Journal of Biological Sciences* **9**, 381-384.

O'Brien, D.J. (1998) Warble Fly Prevalence in Europe 1997. COST 811.

Pandey, V. S. (1989) Epidemiology of *Oestrus ovis* infection of sheep in the highveld of Zimbabwe. *Veterinary Parasitology* **31**, 275 – 280.

Papadopoulos, E., Prevot, F., Diakou, A., Dorchies, Ph. (2006) Comparison of infection rates of *Oestrus ovis* between sheep and goats kept in mixed flocks. *Veterinary Parasitology* **138**, 382-385.

Razmjou, H., Mowlavi, G., Nateghpour, M., Solaymani- Mohammadi, S., Kia, E.B. (2007) Opthalmomyiasis caused by Flesh fly (Diptera: Sarcophagidae) in a patient with eye melignancy in Iran. *Iranian Journal of Arthropod-Borne Diseases* **1**, 53–56.

Reina, D., Alcaide, M., Martinez-Moreno, J., Sánchez-López, J., Hernández, S., Navarrete, I. (2002) Preliminary

approach concerning chronobiology of *Oestrus ovis* in south-western Spain. In: Good, M., Hall, M.J., Losson, B., O'Brien, D.J., Pithan, K., Sol, J. (Eds.), Mange and Myiasis of Livestock. COST Action 833, EUR 20364, pp. 155–159

Salimi, M., Edalat, H., Jourabchi, A., Oshaghi, M.A. (2010) First Report of Human Nasal Myiasis Caused by *Eristalistenax*in Iran (Diptera: Syrphidae) *Iranian Journal of Arthropod-Borne Diseases* **4**, 77–80.

Sayin, F., Meric, I. (1976) Field trials with Ruelene 6-R and Tiguvonfort he control of Hypoderma larvae in cattle [in Turkish]. *Ankara Üniversitesi Veteriner Fakültesi Dergisi* **28**, 302–307.

Schnur, H.J., Zivotofsky, D., Wilamowski, A. (2009) Myiasis in domestic animals in Israel. *Veterinary Parasitology* **161**, 352–355.

SoleimaniAhmadi, M., Nasirian, H., NazemiGhesmi, A.M., Yaghoobi Ershadi, M.R. (2009) Human extensive head Skin myiasis. *Iranian Journal of Public Health* **38**, 134–138.

Sotiraki, S., Stefanakis, A., Hall, M.J.R. (2002): An outbreak of wohlfahrtiosis on Crete island, Greece. In: Good, M., Hall, M.J., Losson, B., O'Brien, D.J., Pithan, K., Sol, J. (Eds.), Mange and Myiasis of Livestock. COST Action 833, EUR 20364, p. 74.

Soulsby, E.J.L. (1986) Helminths, Arthropods and Protozoa of Domesticated Animals. Seventh Edition, Bailliere Tindall, London.

Stacey, M.J., Blanch, R.J. (1998) A Case of External Ophthalmomyiasis in A Deployed UK Soldier. *Journal of the Royal Army Medical Corps* **154**, 60-62.

Talari, S.A., Yeganeh Moghadam, A., Dehghani, R. (2002):*Chryzomya bezziana* infestation. *Archives of Iranian Medicine* **5**, 56–58.

Tirgari, S., Khalkhali, K., Aghamohammadi, A. (1977) First case of auricular myiasisdue to *Sarcophaga.* (Bercaea) haemorrhoidalis (Fallen) (Dipt.Sarcophagiae). *Entomologist's Monthly Magazine* **112**, 255–256.

Tavassoli, M., Imani, A., Yousefnia Pasha, M., Tukmechi, A., Tajik, H. *(2000) Bacteria Associated with Subcutaneous Abscesses of Cattle Caused by Hypoderma spp Larvae in North of Iran. Veterinary Research Forum* **1**, 123-127

Ul-Hasan, M., Nisar Khan, M., Iqbal, Z., Ahmad Khan, I., Chaduhry, S.A., Sajid, M.S. (2008) Surveillance of Cattle Hypodermosis in District Chakwal, Pakistan. International *Journal of Agriculture and Biology* **10**, 337–339.

Wall, R., French, N., Morgan, K. (1992) Blowfly species composition in sheep myiasis in Britain. *Medical and Veterinary Entomology* **6**, 177–178.

Yilma, J.M., Dorchies, P.H. (1991): Epidemiology of *Oestrus ovis* in southwest France. *Veterinary Parasitology* **40**, 315 – 323.

Yilma, J.M., Genet, A. (2000) Epidemiology of the sheep nasal bot, *Oestrus Ovis* (*Diptera : Oestridae*), in Central Ethiopia. Revue *de MédecineVétérinaire* **151**, 143-150.

Yin, H., Ma, M., Yuan, G., Huang, S., Liu, Z., Luo, J., Guan, G. (2003) Hypodermosis in China. *Journal of Animal and Veterinary Advances* **2**, 179-183.

Zeybek, H. (1988) Distribution of Hypoderma spp in cattle and Angora goat in Ankara province [in Turkish]. *Etlik Veteriner Mikrobiyoloji Dergisi* **6**, 45–56.

Zumpt, F. (1965) Myiasis in man and animals in the Old World. London, Butterworths 267 pp.

Iranian Journal of Veterinary Science and Technology
Vol. 4, No. 1, 2012, 19-28

IJVST

بررسی میازیس در میان دام های ذبح شده در کشتارگاه کاشان به عنوان توصیف یک مشکل حشره شناسی دام پزشکی در مناطق گرمسیر

روح ا... دهقانی[۱]، محمد مهدی صداقت[۲*] ، نادر اسماعیلی[۳]، احمد قاسمی[۳]

[۱]گروه بهداشت محیط ، دانشکده بهداشت، دانشگاه علوم پزشکی کاشان
[۲]گروه حشره شناسی پزشکی، دانشکده بهداشت، دانشگاه علوم پزشکی تهران
[۳]گروه پاتوبیوژی، دانشگاه علوم پزشکی کاشان

دریافت مقاله: ۱۳۹۰/۷/۴ پذیرش نهایی: ۱۳۹۰/۱۱/۲۷

چکیده

میازیس یکی از مسائل حشره شناسی دام پزشکی در کشتارگاه‌ها می باشد. در این بررسی شیوع میازیس دربین دام‌های ذبح شده در کشتارگاه کاشان در سال ۱۳۸۹ مورد بررسی قرار گرفت. تمام انواع لاروهای دوبالان که ایجاد میازیس می کنند از دام های کشتار شده جمع‌آوری و سپس شیوع آلودگی هر یک با استفاده از آزمون‌های آماری مورد تجزیه و تحلیل قرار گرفت.

نتایج بررسی وجود چهار گونه لارو متعلق به دو خانواده سارکوفاژیده واستریده را در بین دام ها نشان داد. از خانواده سارکو فاژیده گونه ولفارسیا مگنیفیکا (۳/۸٪) واز خانواده استریده گونه های هایپودرما لینه آتوم (۶۱/۴٪)، هایپودرما بوویس (۱۲/۶٪) و استروس اویس (۲۲/۷٪) شناسایی گردید. ۲/۵در صد بزها و ۰/۵ در صد از گوسفندان از میان ۷۷۳۶ دام مورد بررسی دارای آلودگی به لارو دوبالان بودند. آزمون‌های آماری بین جنس میزبان و وجود لارو، میزبان‌های آلوده و نوع لارو، قسمت‌های آلوده بدن دام و شیوع میازیس، و نهایتاً وجود میازیس و مبدأ ورود دام به کاشان انجام گرفت.

احتمال آلودگی بزها ۱/۴۳ برابر احتمال آلودگی گوسفندان (odds ratio=1.43) تعیین گردید. نتایج حاصل از این بررسی می‌تواند مورد توجه و استفاده مسئولین جهت کنترل میازیس دام قرار گیرد. نیاز به انجام مطالعات مشابه در سایر نقاط کشور به منظور تعیین شیوع میازیس در دام‌ها به منظور روشن ساختن این عارضه در کشور و منطقه می‌باشد.

واژگان کلیدی: میازیس، ولفارسیا مگنیفیکا، هایپودرما لینه آتوم، هایپودرما بوویس، استروس اویس، کاشان